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A Review of the Mexican Forms of the Lizard Genus  
*Sphaerodactylus*

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ABSTRACT: The four forms of *Sphaerodactylus* described from Mexico are discussed. *Sphaerodactylus glaucus* Cope and *Sphaerodactylus torquatus* Strauch are regarded as valid forms belonging in the Mexican fauna. *Sphaerodactylus anthracinus* Cope, is valid but its Mexican origin may be questioned. The status of *Sphaerodactylus inornatus* must be regarded as doubtful both as to its place of origin and its validity as a species.

THE diminutive lizards of the genus *Sphaerodactylus* have been known definitely from Mexico since the publication of the description of *Sphaerodactylus glaucus* Cope, in 1865. Nevertheless they have remained rarities in collections, at least until recently. Barbour who reviewed the genus in 1921, said of *S. glaucus*: "It appears in so very few of the many collections made in Mexico and Central America that it must be very rare."

In 1936 Doctor Hobart M. Smith obtained in Campeche a series of 82 specimens belonging to the species *Sphaerodactylus glaucus*. Doctor Norman Hartweg and Doctor James Oliver succeeded in obtaining a series of 56 specimens of *S. glaucus* in Tehuantepec. Of these they state "vicinity of Tehuantepec; Quiengola Mountain UMMZ. Nos. 82292-82303 (56). All except three of the specimens seem to be typical *glaucus*; the 3 each have a dark collar on the neck." (Hartweg and Oliver 1940.)

Four species have been described from type localities in Mexico. These are *Sphaerodactylus anthracinus* Cope, "Mexico" [Jalapa?], December, 1861; *Sphaerodactylus glaucus* Cope, near Mérida, Yucatán, 1865; *Sphaerodactylus torquatus* Strauch, "Mazatlán," Mexico, May, 1886; and *Sphaerodactylus inornatus* Peters, "Mexico," 1873. Barbour who reviewed the genus in 1921 regarded *anthracinus* as a valid species but one not occurring in Mexico; *torquatus*

as a synonym of *glaucus*; and *inornatus* as a synonym of *lineolatus*, but from some locality, not Mexican. The status of these four forms is discussed in the following pages.

### *Sphaerodactylus anthracinus* Cope

*Sphaerodactylus anthracinus* Cope, Proc. Acad. Nat. Sci. Philadelphia, Dec. 1861, p. 500 (Type description; type locality, "Mexico," [Jalapa?] Mus. Philadelphia); von Müller, Reisen in Vereinigten Staaten, Canada und Mexico, vol. 3, 3rd pt., 1865, p. 599 (listed from Mexico; no specimen, Cope cited); Cope, Bull. U. S. Nat. Mus., No. 32, 1887, p. 27 (listed from Mexico); Peters, Monatsb. König. Akad. Wiss. Berlin, 1869, p. 874 (listed from Puebla); Boulenger, Catalogue of the Lizards in the British Museum (Natural History), vol. 1, 1885, p. 225 (Mexico; San Domingo, one specimen); Günther, Biologia Centrali-Americana, 1885, p. 83 (no specimens); Barbour, Mem. Mus. Comp. Zool. Harvard College, Vol. 47, No. 3, Dec. 1921, pp. 258-259 (Andros Island).

Cope believed that the types of *Sphaerodactylus anthracinus* came from Mexico, and listed Mexico as the type locality for the species. Barbour, who had available two specimens from Middle Bight, Andros Island, Bahamas, the types of *Sphaerodactylus asper* Garman, found the two species to be synonymous, and concluded that the type of *anthracinus* must have originated on Andros Island. He states (Barbour 1921 p. 258): "The original description stated that the type came from Mexico. This has been copied by Boulenger and others. It seemed at once highly improbable that a sphaerodactyl of this style should occur upon the mainland. The type-specimen was, therefore, carefully examined and found to be absolutely identical with examples from Andros Island in the Bahamas. It has not been rediscovered in Mexico, and the locality is certainly erroneous."

Contrary to the statement that the form had not been rediscovered in Mexico, is the published statement of Peters (1869) who records a specimen from Puebla (presumably from near Izucar de Matamoros in the southern part of the state). This collection made by Hr. Berkenbusch, was sent from Mexico and there seems to be little chance of a mix-up of data. Whether it is misidentified is another question; but the size, the unusual iron gray color and the character of the large scales seem to preclude the chance of its being confused with the small smooth scaled *torquatus* or *glaucus*. This reference seems to have been overlooked by Barbour. Boulenger lists a British Museum specimen from San Domingo, a reference either overlooked or not mentioned by Barbour.

Perhaps one would be unwise to state definitely that the species occurs in Mexico on the basis of the two published records. However there is certainly as strong a possibility that it does occur as that it does not. Careful search made in the cities of Jalapa, Vera-

cruz, and Matamoros, Puebla, as well as in their surroundings may bring about its rediscovery. The fact that the species has not been taken in recent collections is certainly no proof that it does not occur.

The following type description is brief but the characters given are diagnostic.

"*S. anthracinus* Cope.

Size large, (head and body 1 inch, 9 lines); muzzle elongate acute; labials four above, two large and three small below; supranasal plates small, superior; frontal scales keeled; the dorsal strongly keeled, rounded, in ten rows on each side, extending for a considerable distance on the tail. Gular scales smooth. Color black, the large dorsal scales tinged with blue.

*Hab.* Mexico. Mus. Philadelphia."

### *Sphaerodactylus inornatus* Peters

*Sphaeriodactylus inornatus* Peters, Monatsb. König. Akad. Wiss. Berlin, 1873, p. 738 (type description; type locality Mexico, "Zwei exemplare aus Mexico; aus der Uhde'schen Sammlung; No. 4589. M. B.")

This species was questionably referred to the synonymy of *Sphaerodactylus glaucus* by Boulenger (1885) and it also appears in the synonymy of the species in Günther (1885). Apparently no change in this status was suggested until Barbour (1921) placed the form in the synonymy of *Sphaerodactylus lineolatus* Lichtenstein. He writes as follows of *lineolatus*: "This species seems to range widely through Lower Central America while *glaucus* is more northern in its range. Both species are known from Guatemala. Peters' type of *inornatus*, apparently a synonym of this species, is said to have come from Mexico far from the known range of *lineolatus*. It is more probable that the locality is incorrect than that Peters so noted for his precise and careful observing would have missed the peculiar dorsal squamation of *glaucus*."

The description of *S. inornatus* as given by Peters, follows:

"Sehr nahe verwandt mit *Sph. punctatissimus* D. B., aber die Schnauze ist kürzer, ohne Canthi rostrales, das Rostralschild is ebenfalls kürzer und merklich höher, die Supranasalia sind kleiner und die ganze Beschuppung is etwas feiner. Die sehr kleinen Rückenschuppen sind flach und glatt, ebenso wie die merklich grösserer Bauchschuppen. Labialia jederseits vier oben und unten.

Graubraun mit einzelnen kleiner schwarzen Punkten namentlich an den Körperseiten. Mit der Lupe betrachtet sind die einzelnen Rückenschuppen mit zwei bis drei kleinen dunkeln Pünktchen versehen.

Zwei Exemplare aus Mexico; aus der Uhde'schen Sammlung. (No. 4589 M. B.)"

Whether Boulenger or Barbour is correct regarding the synonymy cannot be stated at the present time. It is significant that Peters describes a species with markings unlike the Mexican *glaucus* and states concerning the squamation "Rückenschuppen sind flach und glatt." This is very different from the described squamation of *lineolatus* of which Boulenger says: "slightly keeled;" and Barbour: "extremely small juxtaposed granules, the centre of each swollen into what might be considered a keel." Until more material of this presumed species is discovered in Mexico, *inornatus* (or *lineolatus*) must have only a doubtful right to a place in the Mexican faunal lists.

### *Sphaerodactylus torquatus* Strauch

*Sphaerodactylus torquatus* Strauch, Mem. Acad. Imp. Sci. St. Petersburg 1887, 7th ser. vol. 35, No. 2, May 1886, pp. 35-86 (type description; type locality, Mazatlán; No. 3268, Mus. Petrograd. 3 specimens. Hr. Salmin 1871 coll.); Günther, Biologia Centrali-Americana 1885, p. 82 (no specimens); Taylor, Univ. Kansas Sci. Bull., vol. 24, No. 20, 1936 (1937) p. 506, no specimens; listed for Sinaloa.

*Sphaerodactylus glaucus* (part.) Barbour, Mem. Mus. Comp. Zool. Harvard Coll. vol. 47, No. 3, 1921, pp. 240-241 (*torquatus* placed in synonymy).

The discovery of 25 specimens of *Sphaerodactylus* in Tehuantepec having characteristics of the species described by Strauch as *torquatus*, suggests the wisdom of removing this species from the synonymy of *S. glaucus* where it was placed by Barbour.

The illustrations of the color pattern of nearly equal-sized specimens of *torquatus* and *glaucus* on the somewhat conventionalized body outlines show the characteristic differences in the markings of the young of the two species. Of the numerous young of *glaucus* in the EHT-HMS collection, all specimens fit the pattern as depicted for that form. See fig. 2.

The type description of this species follows:

"*Sphaerodactylus torquatus* n. sp.

3268. Mazatlan. Hr. Salmin 1871, (3 Ex.).

Zunächst mit *Sphaerodactylus glaucus* Cope verwandt, mit dem er die kleinen, nicht gekielten Rumpfschuppen und das mässige grosse Rostralschild gemein hat, von dem er sich aber durch den viel gestreckteren Kopf, die gestrecktere, mehr zugespitzte Schnauze und die verschiedene Färbung und namentlich Zeichnung unterscheidet.

Die Schnauze unbedeutend länger, als der Zwischenraum zwischen Ohröffnung und Orbita. Die Ohröffnung klein und ausgesprochen horizontal gestellt. Das Rostrale von mässiger Grösse,

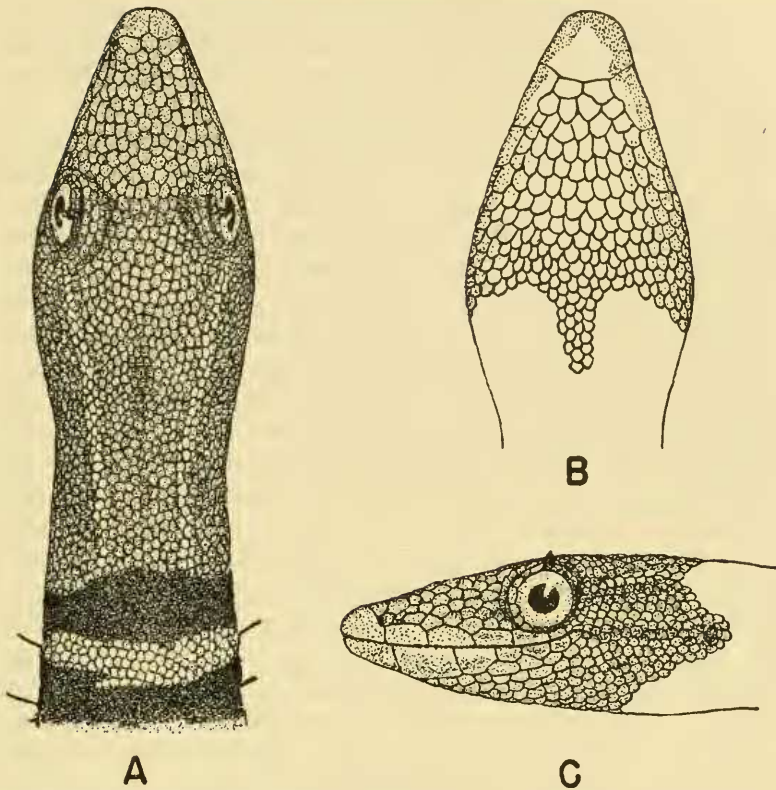


FIG. 1. *Sphaerodactylus torquatus* Strauch. A, dorsal view of head and neck; B, ventral view of head; C, lateral view of head (all greatly enlarged and slightly diagrammatic).

genau so beschaffen, wie Boulenger es auf Tafel XVIII, Fig. 3 von *Sphaerodactylus glaucus* Cope abgebildet hat. Jederseits 6 Supralabialia, die letzten sehr klein. Das Mentale gross, bedeckt die Spitze des Unterkiefers und besitzt einen leicht bogenförmigen Hinterrand; zu jeder Seite desselben stehen 6 Infralabialia, von denen die 3 vorderen sehr gross, die 3 hinteren dagegen sehr klein sind. Zwei grosse neben einander liegende Submentalia und hinter denselben 3 etwas kleinere in einer Querreihe; hinter diesen letzteren noch 2 oder 3 Querreihen von Schildchen, die successive an Grösse ab-, an Convexität aber zunehmen und so allmählich in die Kornschuppen der Kehle übergehen. Das Augenlid hat in der Mitte seines Oberrandes einen kleinen, nach hinten gerichteten Dorn. Die Oberseite aller Theile mit kleinen flachen Schuppen

bedeckt, die auf dem Hinterkopfe besonders klein, kornförmig sind. Die Kehlschuppen sind, wie schon bemerkt, klein und convex, die Bauchschuppen dagegen plan, etwa doppelt so gross, wie die Rückenschuppen, und dachziegelförmig gelagert.

Die Oberseite zeigt auf hellen braunlichgelben Grunde braune Vermiculationen, die auf dem Kopfe in der Längsachse des Thiers verlaufen, während sie auf dem Rumpfe mehr der Quere nach gerichtet sind. Die Oberseite des Halses ist mit einem weissen, breit schwarz gerandeten Halsbande versehen, d. h. es finden sich daselbst drei gleichbreite Querbinden, eine vordere schwarze, die vor die Schulter liegt, eine mittlere weisse, welche die Schulter berührt, und eine hintere schwarze, welche hinter der Schulter liegt und in die Achselhöhle herabsteigt. Der Schwanz ist bei den beiden grösseren Exemplaren reproducirt und erscheint fast einfarbig bräunlich gelb, da die braunen Vermiculationen daselbst nur andeutungsweise vorhanden und sehr vereinzelt sind. Bei dem kleinen Stück dagegen, dessen Schwanz viel länger und sehr dünn ausgezogen, also augenscheinlich nicht reproducirt ist, zeigt er in seinem Enddrittel ähnliche Zeichnungen, wie sie nach Boulenger bei *Sphaerodactylus glaucus* vorkommen. Die äusserste Spitze ist nämlich weiss, vor derselben findet sich ein breiter schwarzbrauner Ringel; vor diesem Ringel sieht man auf der Oberseite in gleichen Abständen noch mehrere weisse Flecken, die mehr oder weniger deutlich braun gesäumt sind und nach der Schwanzbasis zu immer undeutlicher werden. Die Unterseite aller Theile ist sehr hell bräunlichgelb.

Maasse. Totallänge 49 mm.; Länge des Kopfes—8 mm.; des Rumpfes—21 mm.; des Schwanzes—20 mm. Bei dem kleinen Exemplar, dessen Schwanz, wie schon bemerkt, nicht reproducirt ist, beträgt die Länge dieses letzteren etwas mehr, als diejenige von Kopf und Rumpf zusammengenommen."

Whether "Mazatlan" the type locality of *Sphaerodactylus torquatus* is the port of that name on the west coast of Mexico is not certain. However it has generally been presumed that this seaport was meant. I searched for the species in 1934 while collecting in the vicinity of Mazatlán, Sinaloa, but found neither this species nor two other gekkoes that are mentioned by Strauch (1886) as having been taken at the same locality. These latter appear as follows in the same work:

"*Phyllodactylus tuberculosus* Weigmann

2688 Mazatlan Hr. Salmin 1870

2689 Mazatlan Hr. Salmin 1870 (2 ex.)

2690 Mazatlan Hr. Salmin 1870 (3 ex.)

*Phyllodactylus galapagensis* Peters

3257 Mazatlan Hr. Salmin 1871"

The presence of this latter species seems to be an error of identification or of locality—possibly both.

The possibility that the name "Mazatlan" refers to some other locality has been considered. In Mexico there is a "Mazatlán" in Jalisco and one near Chilpancingo, Guerrero. In the state of Oaxaca there is a Mazatlán San Cristobal near Teotitlan, and Mazatlán San Juan near Tehuantepec. There are at least two species of *Phyllodactylus* (*magnus* and *muralis*), known from this region and the present species *Sphaerodactylus torquatus* likewise occurs there. Whether Hr. Salmin ever visited Oaxaca or obtained specimens from there I cannot say. In other works of Strauch I find specimens accredited to Salmin at about this time from Montevideo and Neu-Freiburg.

If this material can be examined and the actual identity of the two *Phyllodactylus* determined it may be possible to fix the type locality of *torquatus* with greater certainty. I very strongly suspect the locality, if intended for Mazatlán, Sinaloa, is either incorrect or the presence of the species there is to be accounted for by introduction by man.

### *Sphaerodactylus glaucus* Cope

*Sphaerodactylus glaucus* Cope, Proc. Acad. Nat. Sci. Philadelphia, Oct. 1865, pp. 192-193 (type locality, near Mérida, Yucatán; Comision Cientifica under Arthur Schott, coll.; several specimens); Cope, *ibid*, May 1866, p. 125 (types mentioned as collected by Arthur Schott; and a specimen from Tabasco collected by Dr. Berendt); Cope, *ibid*, Oct. 24, 1871, p. 216 (a specimen from Tehuantepec, "collected by the U. S. Expedition to survey the Isthmus of Tehuantepec, by T. Hale Street, M. D."); Bocourt, Mission Scientifique au Mexique et dans l'Amérique Central; Etude sur les Reptiles, Livr. 2, 1873, p. 46, (no specimens); Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 8, 1876, p. 118; Bocourt, Journ. de Zoöl. Paris, vol. 5, 1876, p. 401 (Tehuantepec specimen collected by F. Sumichrast); Sumichrast, Bull. Soc. Zoöl. France for 1880, vol. 5, p. 173 (habits; Tehuantepec); and Sumichrast, La Natureza, vol. 6, entrega 3, 1882, p. 35 ("de ambos costas de la República"); Boulenger, Catalogue of Lizards in the British Museum, (Natural History), vol. 1, 1885, p. 221, pl. 18, fig. 3 (figure showing end of snout, upper view  $\times 2$ ; adult specimen from Verapaz, Guatemala (low forest) and half grown from Veracruz, Mexico, collected by F. D. Godman and O. Salvin); Günther, Biologia Centrali-Americana; Reptilia and Batrachia, 1885, p. 82 (records include Teapa in Tabasco, Belize and Stan Creek, British Honduras; Petén, Guatemala); Cope, Bull. U. S. Nat. Mus. No. 32, 1887, p. 27 (locality list); Strauch, Mem. Acad. Imp. Sci. St. Petersburg, ser. 7, vol. 35, No. 2, May 1886, p. 35 ("No. 4292, Fundort? Hr. H. Shilling 1876"); Dugès, La Natureza, 2d ser. vol. 2, pt. 2, 1896, 479, 484 (occurs in "Tierra Caliente"); Gadow, Proc. Zoöl. Soc. London, June 6, 1906, p. 194, 211 ("Sphaerodactylus sends only three species into Mexico; *S. glaucus* to Salina Cruz [Oaxaca] and into the state of Veracruz, etc."); Barbour, Mem. Mus. Comp. Zoöl. Harvard College, vol. 47, No. 3, Dec. 1921, pp. 240-241, (lists types, and redescribes one cotype, M. C. Z. No. 13,570 formerly part U. S. N. M. No. 6,572); Allen, Copeia, No. 169, 1928, p. 98-99 (specimen of

uncertain provenance, carried in bananas); Barbour and Loveridge, Bull. Mus. Comp. Zoöl. Harvard Coll. 49, No. 10, 1929, p. 342 (condition of cotype); Gaige, Carnegie Institution Washington Publication No. 457, 1936, p. 295 (color description of one specimen from Tuxtepec Camp, Campeche); Smith, Occ. Papers Mus. Zoöl. Univ. Michigan, No. 388, Oct. 31, 1938, p. 13 (*Part.*) (specimens from Campeche): Ciudad del Carmen (10), Balchacaj (72), Apazote (1); Hartweg and Oliver, Misc. Publ. Mus. Zoöl. Univ. Michigan, No. 47, July 13, 1940, p. 14, (*part.*) (56 specimens; vicinity of Tehuantepec; Quiengola Mountain "all except 3 of the specimens seem to be typical *glaucus*. The three each have a dark collar on the neck)."

The rather brief type description of this species follows.

*"Sphaerodactylus glaucus.*

Dorsal scales very small, but flat, rounded, smooth; about ninety series round the body; abdominals larger, rounded, about forty-four rows from vent to axilla, continued larger on under side of tail (not reproduced in this specimen). Labials  $\frac{3}{4}$ , three scales bordering mental. Supraorbital mucro (*sic*) present, orbit equal from its border to, or little beyond, nostril; muzzle and front gradually acuminate. Auricular meatus smaller than digital palette. Above light brown, "greenish stone color or *glaucus*" in life, with minute paler spots and dark vermiculations; below whitish. Tail in life orange, more intense toward tip; in spirits with two yellow black-edged spots near tip, and one on each side the origin. Limbs and digits annulated with yellow, black bordered.

Muzzle to axilla, 5.5 lines; Muzzle to vent, 11.6 lines; vent to end of tail, 10.4 lines.

*Habitat.*—Near Merida, Yucatan. Coll. Comision Cientifica under Arthur Schott.

Allied to the *cinereus* and *sputator*, and somewhat intermediate between them. The second from Mexico."

The coloration of the young and half grown specimen (after preservation in formalin and alcohol) is of a somewhat uniform brownish, variable in shade, but growing lighter on the sides and gradually merging in the cream white of the venter. Anterior to a line joining the point of insertion of the arms is a median dark spot, flanked on each side with a cream spot; on each side of the body are two indistinct series of tiny cream spots; usually five or six are discernible and these tend to alternate with one another. There may be a more or less indistinct medial hair-line of darker pigment on occiput and also a hair-line on each side running back from eye on the occiput; some specimens (all perhaps to a greater or lesser degree) show an indefinite, darker canthal line which extends behind the eye on to the side of neck. Labials, both upper and lower, with darker areas.

On the arm there is a distinct cream spot on the elbow and a



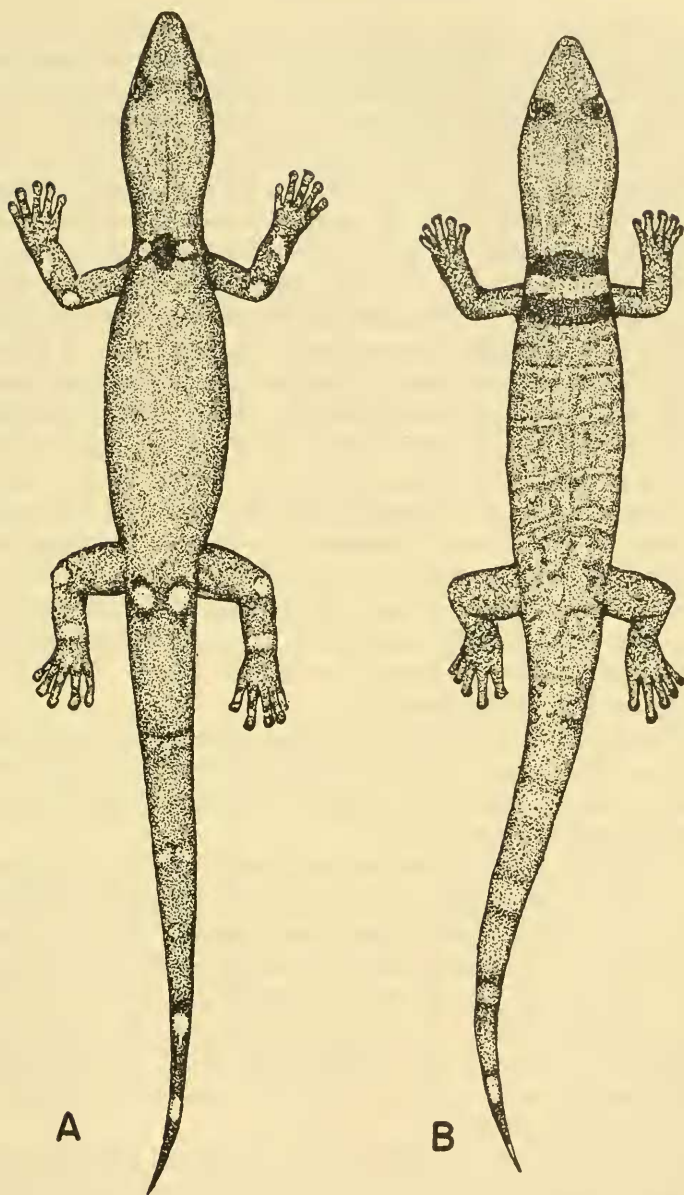


FIG. 2. A, *Sphaerodactylus glaucus* Cope. Somewhat diagrammatic showing the juvenile color pattern. Much enlarged. B, *Sphaerodactylus torquatus* Strauch. Somewhat diagrammatic, showing the juvenile color pattern. Much enlarged.

cream spot on the outer face of the arm; the fingers are annulated with cream at the joints. The leg has a knee spot of cream and a spot almost forming a band about middle of the lower part of leg. There are cream spots or annulations at the toe joints.

At the base of the tail there are two rounded spots of cream, variable in distinctness; toward the tip, when the tail is complete, there are two cream bands bordered by black on each side; occasionally whitish flecks are discernible toward the base. Ventrally on the tail the enlarged scales are cream at the base of the tail and in older specimens the color may extend to the tip; the flanking scales on each side are pigmented and this pigment may encroach slightly on the median series. The side of the head and neck is usually darker than the dorsal part of the head. The line bordering the dorsolateral darker stripe or line, may be lighter than the dorsal parts as a whole, suggesting a dim line running back from eye. There are indications of minute lighter dots scattered on the back.

In most if not all older specimens the spot on the shoulders is narrowed and lengthened somewhat, and the cream spots bordering it may be dim or altogether lost. The banding of the tail will be lost except that there usually remains one or two terminal cream and dark stripes usually less intense than in the young. (Note Fig. 2, showing markings of the young.)

The coloration in life differs somewhat from that of the preserved specimens. The cream spots are usually described as orange, reddish orange or pale red especially on tail. The general dorsal coloration is greenish gray or gray brown.

Mrs. Helen T. Gaige (1936) has described a specimen identified as *Sphaerodactylus glaucus* from Tuxpena Camp, Campeche as follows:

"Color gray with a single large black spot just behind the nape, followed by a spot lighter than the ground-color edged with two smaller black spots posteriorly; two conspicuous black dorsal spots between the hind legs, followed by a light spot; sides of neck with longitudinal stripes of gray. Nape with three converging dark longitudinal stripes; a faint indication of a darker gray stripe between fore and hind leg."

The present known distribution of the form in Mexico includes Yucatán, Campeche, Tabasco, Oaxaca and Veracruz. The most northern record is on the Jalapa-Veracruz highway about 20 miles from the city of Veracruz. I obtained the specimen from the bark of a small tree at the edge of a lagoon.

## CONCLUSION

Of the four species of the genus *Sphaerodactylus* described from actual or presumed type localities in Mexico, *Sphaerodactylus glaucus* and *Sphaerodactylus torquatus* must be regarded as valid forms, since each is known from specimens unquestionably originating in southern Mexico. Despite the fact that the types of *Sphaerodactylus anthracinus* were reputed to come from Mexico and a specimen has been reported by Peters from Puebla, its presence in Mexico must be verified before it can have a certain place on Mexican faunal lists. Concerning *Sphaerodactylus inornatus*, Boulenger regarded it a synonym of *S. glaucus* and Barbour, a synonym of *lineolatus* and as coming from some locality not Mexican. Until the type is reëxamined the status of this form must remain in question.